

Appl. No. 10/696,715

Amdt. Dated 3/16/2006

Response to Office action dated 12/16/2005

REMARKS

Claims 1-14 and 16 have been amended. No new matter has been added. Claims 1-16 are pending.

Disclaimers Relating to Claim Interpretation and Prosecution History Estoppel

Claims 1-14 and 16 have been amended, notwithstanding the belief that these claims were allowable. Except as specifically admitted below, no claim elements have been narrowed. Rather, cosmetic amendments have been made to the claims and to broaden them in view of the cited art. Claims 1-14 and 16 have been amended solely for the purpose of expediting the patent application process, and the amendments were not necessary for patentability.

Any reference herein to "the invention" is intended to refer to the specific claim or claims being addressed herein. The claims of this application are intended to stand on their own and are not to be read in light of the prosecution history of any related or unrelated patent or patent application. Furthermore, no arguments in any prosecution history relate to any claim in this application, except for arguments specifically directed to the claim.

Drawings

The Draftsman objected to Figure 1 under 37 CFR § 1.84(p)(5) because it includes the following reference not mentioned in the description: "AD In". Paragraph [0026] of the specification has been amended to overcome this objection.

Specification

The Examiner objected to page 7, line 10 because there is no switching element Tr1 and a resistor R4 that are provided to the battery control circuit of FIG. 5. Paragraph [0024] of the specification has been amended to overcome this objection.

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The Examiner objected to page 11, line 1 because the variable description for the time period doesn't correspond to the one in the drawing. Paragraph [0032] of the specification has been amended to overcome this objection.

The Examiner objected to page 14, line 9 because the term inventions should be singular. Paragraph [0042] of the specification has been amended to overcome this objection.

Claim Rejections - 35 USC § 102

The Examiner rejected claims 1-4, 6, 7, 9 and 12 under 35 USC § 102(b) as anticipated by Takahashi (USP 6,134,391). This rejection is respectfully traversed.

Takahashi is directed to a battery checking apparatus which measures the remaining power of different types of batteries based on a voltage appearing at resistors 21 and 22 when a current is being supplied to resistors 21 and 22.

In contrast, the claimed battery control circuit determines residual capacity of a battery based on the information regarding a change in the voltage appearing at the voltage-dividing resistors R1, R2 between when the switching element Tr1 is off and when the switching element Tr1 is on.

Claim 1:

Claim 1 is independent. Claim 1 recites, among other features, "a battery voltage detecting section for detecting a voltage of a battery." The Examiner asserted that Takahashi's battery level checking circuit 20 and voltage regulator 30 disclose the claimed battery control circuit and battery voltage detecting section. In fact, Takahashi's voltage regulator 30 does not detect a battery voltage, but provides a stable voltage to the CPU 10. Therefore, Takahashi does not disclose this feature.

Claim 1 recites, among other features,

a battery controlling section for acquiring information relating to a change between the voltage of said battery detected by said battery voltage detecting section when said

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switching element is ON and the voltage of said battery detected by said battery voltage detecting section when said switching element is OFF by turning on said switching element to allow a current of said battery to flow through said resistor and by turning off said switching element.

The Examiner asserted that Takahashi discloses the claimed battery controlling section at FIG. 1 items 10 and 30, 1:45-46 and 4:32-33. However, Takahashi's circuit determines the residual power of a battery based on the voltage detected by the load resistors 21, 22 when the switching transistor 24 is on (see Takahashi 5:27-36). Therefore, Takahashi's circuit does not disclose a battery controlling section for acquiring information relating to voltage change between when the switching element is ON and when the switching element is OFF. In fact, Takahashi does not utilize information relating to voltage change at all.

Therefore, it is respectfully requested that the rejection be withdrawn.

Claim 2:

By virtue of its dependence from claim 1, claim 2 is patentable over Takahashi.

Claim 2 recites, among other features, "said first and second voltage-dividing resistors are connected to said resistor and said switching element in parallel, and a voltage at a connection point between said first and said second voltage-dividing resistors is detected as the voltage of said battery." The Examiner asserted that this feature is disclosed by Takahashi's voltage regulator 30. However, Takahashi's voltage regulator 30 does not include voltage dividing resistors R1, R2. Moreover, Takahashi does not disclose the claimed connection point between the first and second voltage dividing resistors defining a battery voltage when the switching transistor 24 is on.

Therefore, it is respectfully requested that the rejection be withdrawn.

Claims 3 and 6:

By virtue of their respective dependence from claims 1 and 3, claims 2 and 6 are patentable

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over Takahashi.

Claims 4, 7, 9 and 12:

By virtue of their respective dependence from claims 1, 2, 3 and 6, claims 4, 7, 9 and 12 are patentable over Takahashi.

Claims 4, 7, 9 and 12 each recite, among other features, “the voltage recovery time measurement section for measuring a time period from a time when the switching element is turned off to a time when the voltage of the battery detected by the battery voltage detecting section recovers to a predetermined voltage value.” In Takahashi, the time period is defined as a predetermined value according to battery types. For example, the time period is set 3ms for a lithium battery (see Takahashi, 9:10-18). Because Takahashi’s time to be measured is a fixed constant, not variable, Takahashi does not disclose this feature.

Therefore, it is respectfully requested that the rejection be withdrawn.

Claim Rejections - 35 USC § 103

The Examiner rejected claims 5, 8, 10, 11 and 13-16 under 35 USC § 103 as obvious from Takahashi in view of Miyakawa et al. (USP 5,912,544). This rejection is respectfully traversed.

Miyakawa is directed to a memory unit 7 storing discharge characteristic data and a voltage range for display of a remaining power of the battery 10. Miyakawa’s discharge characteristic data indicates a relationship between a battery voltage and a discharge time (see Miyakawa, FIG. 4). Miyakawa’s voltage range for display of a remaining power indicates a relationship between battery voltage and remaining power of a battery (see Miyakawa Fig. 5).

Claims 5, 8, 10, 11, 13 and 14:

By virtue of their respective dependence from claims 1, 2, 3, 4, 6 and 12, claims 5, 8, 10, 11,

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13 and 14 are patentable over Takahashi. The Examiner has not set forth how Miyakawa overcomes the shortcomings of Takahashi.

Claims 5, 8, 10, 11, 13 and 14 each recite, among other features, "a storing section for storing characteristics information of relation between the information relating to change in a battery voltage and a residual capacity of the battery." The Examiner asserted that Miyakawa teaches this feature at FIG. 1, items 7 and 10 and 1:35-37. However, because Miyakawa only stores discharged characteristics, not the information regarding the change in battery voltage, Miyakawa does not teach or suggest this feature. Therefore, claims 5, 8, 10, 11, 13 and 14 are patentable over Takahashi in view of Miyakawa.

Therefore, it is respectfully requested that the rejection be withdrawn.

Claims 15 and 16:

By virtue of its multiple dependence from any of claims 1-14, claim 15 is patentable over Takahashi in view of Miyakawa. By virtue of its dependence from claim 15, claim 16 is patentable over Takahashi in view of Miyakawa.

Claim 16 recites, among other features, "the resistor is an actually operating load of the electronic device." Nothing within Takahashi or Miyakawa discloses, teaches or suggests reducing the number of components by using the resistor connected to the switching element Tr1 as an actually operating load.

Therefore, the rejection is respectfully requested to be withdrawn.

Conclusion

It is submitted, however, that the independent and dependent claims include other significant and substantial recitations which are not disclosed in the cited references. Thus, the claims are also patentable for additional reasons. However, for economy the additional grounds for patentability are not set forth here.

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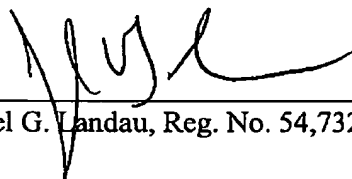
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In view of all of the above, it is respectfully submitted that the present application is now in condition for allowance. Reconsideration and reexamination are respectfully requested and allowance at an early date is solicited.

The Examiner is invited to call the undersigned attorney to answer any questions or to discuss steps necessary for placing the application in condition for allowance.

Respectfully submitted,

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